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U.S. Army Toxic and Hazardous Materials Agency

Report of Sampling and Analysis Results

Holmdel Army Housing Units
Holmdel Township, New Jersey

August 1990

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Prepared for:

U.S. ARMY TOXIC AND
HAZARDOUS MATERIALS AGENCY
Aberdeen Proving Ground
Maryland 21010-5401

Prepared by:



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<p>Roy F. Weston, Inc. has conducted a sampling and analysis program of the Army housing property located in Holmdel Township, New Jersey. The objectives of this effort include further characterization of environmental contamination identified in an enhanced preliminary assessment carried out in 1989. The specific activities performed at this site were identification, evaluation of the condition, and collection of samples from specific suspected asbestos-containing materials, including floor tiles, pipe run and pipe fitting insulation, dust in the ductwork, and exterior siding, where present. These evaluations were necessary to clarify potential environmental issues identified in the earlier report, prior to the sale or realignment of the property.</p>			
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**SAMPLING AND ANALYSIS AT THE U.S. ARMY
FAMILY HOUSING UNIT (FHU) PROPERTY
HOLMDEL, NEW JERSEY**

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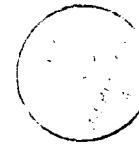
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SAMPLING AND ANALYSIS AT THE U.S. ARMY
FAMILY HOUSING UNIT (FHU) PROPERTY
HOLMDEL, NEW JERSEY

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EXECUTIVE SUMMARY

The U.S. Army family housing units (FHUs) at Holmdel, New Jersey were inspected by Roy F. Weston, Inc. (WESTON) personnel during February and March 1990 to further evaluate the environmental concerns identified in the enhanced Preliminary Assessment reports prepared and submitted earlier by Argonne National Laboratory (ANL) for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). Three of the 12 single-family "Capehart" housing units were examined on 21 February to investigate the possible presence of asbestos-containing materials (ACM). The utility trench investigation was performed on 02 March, with the assistance of the Directorate of Engineering and Housing (DEH) staff. Transformers scheduled for inspection are owned by Jersey Central Power and Light Co. (JCP&L) and WESTON was not allowed to examine them.

The ANL Draft Sampling and Analysis Plan, Revision 1 (SAP) specified identifying and sampling of the following materials that frequently are suspected to contain asbestos, from ten per cent of the housing units or a minimum of three, whichever is greater.

- Pipe run insulation.
- Dust accumulated inside heating ductwork within the concrete slab, where present and open.
- Vinyl floor tiles.

The WESTON personnel selected three housing units for inspection after review of maintenance records and drawings, discussions with housing management personnel, and determination that all the units were in similar condition. The housing units chosen, Nos. 203, 206, 211, were considered to be representative of the 12 units, but this was not confirmed by an examination of all units.

Twelve samples of dust and six samples of floor tile and vinyl sheeting were collected by WESTON from the three units and analyzed. These analyses revealed that asbestos is present in dust accumulated within the heating ductwork and in vinyl floor covering at the three housing units examined. Asbestos was found in nine of the twelve dust samples by Transmission Electron Microscopy (TEM), and in at least two samples from each unit. Asbestos was quantified at 3% or greater by polarized light microscopy (PLM) in two samples of the floor coverings. In addition, one floor covering sample was found by PLM at less than 1%. No pipe insulation samples were collected since the pipes in the units examined were not insulated. During the asbestos sampling activity, other suspect materials observed within the units were cloth expansion joints on the heating units and roofing materials.

The following practices should be observed with regard to the known and suspected asbestos-containing materials identified:

- The risks posed by the asbestos-containing dust in the ductwork cannot be clearly evaluated, because the sampling and analysis program only included a qualitative screening of this material since no approved quantitative procedure exists. Further studies, such as air sampling are recommended to determine if asbestos is becoming airborne and to define what risks, if any, are presented by these findings. These studies could not be performed at this facility as a part of the follow-up effort because there was no vacant unit at that time.

- The vinyl floor coverings pose no significant risk as long as they are in good condition and are not damaged by excessive wear or misuse. The materials should be left in place and managed under an Operations and Maintenance (O&M) program which describes procedures for the regular inspection of the floor coverings and the removal and replacement of any that become damaged.
- Other suspect materials identified but not sampled, including cloth expansion joints and roofing materials, should be assumed to contain asbestos and managed in place under an O&M program until they are either removed or determined to contain no asbestos.

The SAP stated that a utility trench which may once have connected the housing units to the Nike installation should be sampled. The local DEH representative, who had been assigned to his position for only a few weeks at the time of the field assessment, was unable to locate this utility trench. There was no surficial or topographical evidence to aid in this assessment. Based on the inability of the field crew and DEH support personnel to identify the trench location, this sampling activity could not be performed.

Investigation of the electrical supply system at the property revealed that all transformers located on the property are owned by JCP&L. Transformer ownership was verified in a letter supplied by the Department of the Army, Directorate of Engineering and Housing, Fort Dix, New Jersey. WESTON concludes ownership and responsibility for testing the transformers does not lie with the U.S. Army; therefore transformer oil samples were not obtained for PCB analysis.

SECTION 1. INTRODUCTION

**SAMPLING AND ANALYSIS AT THE U.S. ARMY
FAMILY HOUSING UNIT (FHU) PROPERTY
HOLMDEL, NEW JERSEY**

SECTION 1. INTRODUCTION

Roy F. Weston, Inc. (WESTON) was retained by Argonne National Laboratory (ANL) to provide assistance in gathering additional environmental data for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) at 53 family housing unit (FHU) properties in 12 states. The Holmdel, New Jersey property is one of these FHUs.

1.1 PURPOSE AND SCOPE

The purpose of this project was to provide the Department of the Army with sound environmental data on the properties which are scheduled for sale or realignment as a result of the Defense Authorization Amendments and Base Closure and Realignment Act (Public Law 100-526). Environmental assessments of each property covered by the Act are required by the Secretary of Defense prior to their closure or realignment. Such actions must be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA) to ensure that any environmental hazards will be identified and mitigated where required.

Previously, ANL conducted enhanced preliminary assessments (PAs) for each property. These PAs made recommendations regarding sampling and analysis to determine (1) whether and in what quantities asbestos is present in certain building construction materials (including pipe run insulation, dust accumulated in heating ductwork, vinyl floor tile, and exterior siding shingles, where present), (2) in selected contexts, whether and in what concentration soils and groundwater may be contaminated, and (3) whether and in what range transformer oils at selected sites may contain polychlorinated biphenyls (PCBs). WESTON gathered this data by implementing ANL's Draft FHU Sampling and Analysis Plan, Revision 1 (SAP).

1.2 SITE DESCRIPTION

The Holmdel housing area is located in eastern New Jersey, near the unincorporated village of Crawford Corners, in Holmdel Township, Monmouth County. The property occupies four acres set within surrounding woodland sparsely interspersed with residential areas. The land adjacent to the housing area originally contained the fire-control area of the old Nike battery. The former fire-control area is upgradient of the housing area.

The 12 units at this FHU property are three-bedroom, single-family dwellings built in 1957 in the "Capehart" style. The single-story wood-frame units were constructed on concrete slab foundations with no basement or crawl spaces. The ducts for the original heating system are embedded in the concrete slab which was covered with vinyl floor tile and sheeting. The units have pitched roofs surfaced with asphalt shingles and exteriors finished with vinyl siding.

1.3 REPORT ORGANIZATION

This report contains the results of the sampling and analysis program performed by WESTON. Section 2 contains a description of the asbestos sampling performed at the property and laboratory results for samples of suspected asbestos-containing materials (ACM) collected. Copies of field notes and laboratory reports pertaining to asbestos are provided in Appendices A.1 and A.2, respectively. Section 3 contains a description of field activities and the findings from the utility trench studies. Copies of field notes and supporting data for this activity are included as Appendix B. The efforts related to transformer evaluations are described in Section 4 and supporting information is provided in Appendix C. Section 5 is a summation of all activities and findings for the Holmdel property.

SECTION 2. ASBESTOS-CONTAINING MATERIALS

SECTION 2. ASBESTOS-CONTAINING MATERIALS

WESTON personnel inspected three of the 12 "Capehart" units at the Holmdel family housing facility on 21 February 1990 for the presence of suspected asbestos-containing materials (ACM). Dust accumulated within heating ductwork and vinyl floor tile and sheeting were the only suspect materials found within the buildings that were sampled. All sampling was done following the requirements of ANL's SAP. Additionally, all field work was performed in accordance with applicable Federal regulations, including 40 CFR Part 61 subpart M, 40 CFR Part 763 subpart E, and 29 CFR Part 1910.1001.

2.1 SAMPLING RATIONALE

The sampling rationale used by WESTON for this project followed the recommendations set forth by ANL. The type of suspect ACM to be sampled, the number of housing units to be examined at each FHU facility, and number of samples to be taken for each material found were described in the SAP. The plan for Holmdel required sampling of the following materials, if present:

- Pipe run insulation.
- Accumulated dust inside heating ductwork if not sealed.
- Vinyl floor tiles.

In accordance with the SAP, three units were examined at this facility. The sampling plan, however, did not identify specific units which were to be sampled. The task of determining which housing units were representative of the facility as a whole and, therefore, would be sampled was left to the discretion of the WESTON field team. After reviewing all available maintenance records and drawings and discussing the facility with Directorate of Engineering and Housing (DEH) personnel, it was determined that all of the units at the Holmdel FHU were similar in condition. Units 203, 206, and 211 were chosen by the WESTON field team leader as representative units to be sampled.

The SAP specifies that a minimum of two pipe run insulation samples, four dust samples, and one sample of each color of floor tile be collected from each of the housing units examined. Twelve dust samples and six samples of vinyl floor tiles were collected at the facility. No pipe insulation samples were collected since the pipes in the units examined were not insulated.

2.2 FIELD ACTIVITIES AND OBSERVATIONS

Each of the units was inspected to determine if suspect materials were present. Heating ductwork vents in the units were not sealed, so dust samples were collected by wiping the inner surface of the duct near the designated exhaust vents with a fiber-free wipe selected for its ability to trap dust in a non-fibrous matrix. Each wipe was placed in the jaws of a flexible small parts pick-up tool and moistened with fiber free water. If grille openings were too small, the grille was removed and the tool inserted into the duct opening. The interior surface was wiped to collect dust on the moistened surface of the wipe. After the dust was gathered, the wipe was placed in a small plastic wide-mouth jar, sealed, labeled with the sample number, and shipped to the lab. The grille was then replaced and the tool was cleaned by rinsing and wet wiping the surfaces prior to collecting the next sample. Samples were collected from the living room, kitchen, bedroom, and main bathroom in all three units.

Both white and brown 12" x 12" vinyl floor tile and white vinyl sheeting were sampled. Unit 203 and 206 contained white floor tile while unit 211 contained brown tile, and all three units contained white vinyl sheeting. One sample was taken of each color of floor tiles and the vinyl sheeting found in each housing unit, producing a total of six samples for laboratory determination of asbestos content. These samples were collected by breaking off a small piece of floor covering in an inconspicuous location. About one square inch of the tile surface area was taken for each sample. No effort was made to separate the mastic, which sometimes contains asbestos, from the floor tile samples themselves.

The vinyl floor covering in all three of the units inspected was in good condition. This material is considered to be a non-friable type of ACM, unless damaged. If significant damage occurs, such that the material becomes friable as defined in the asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP), the EPA would classify these tiles as friable materials. However, an EPA opinion was recently released that changes certain previous interpretations regarding non-friable ACM. On 23 February 1990, a memorandum was issued by the Director of Emissions Standards Division, the Director of Stationary Source Compliance Division, and the Associate Enforcement Counsel for Air Enforcement of the EPA Office of Air Quality Planning and Standards (OAQPS). This memorandum was circulated to other air quality officials and EPA regional offices in early March 1990. This latest position states that floor tiles and certain other non-friable materials do not have to be removed from a facility prior to demolition, unless they are severely damaged and thus are considered friable, or unless the demolition may cause fiber release through grinding or abrasion of the tiles. Floor tile removal shall be done if demolition is to be accomplished by burning, either of the unit or of the debris from demolition. However, if the floors in the housing units are to be renovated, special care must be taken during the process to prevent the release of asbestos fibers.

The WESTON field team was directed, as a part of the project scope contained in the SAP, to perform sampling and analysis of specific suspect ACM. Other suspect materials observed were cloth expansion joints on the heating units and roofing materials. Copies of the field notes are included in Appendix A.1.

2.3 LABORATORY PROCEDURES AND RESULTS

The bulk samples of building materials were analyzed for asbestos content by WESTON's optical microscopy laboratory in Auburn, Alabama. This laboratory is accredited by the American Industrial Hygiene Association (AIHA) and the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP). The bulk samples were analyzed by Polarized Light Microscopy (PLM) using the EPA's "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA 600/M4-82-020, December 1982. Copies of the laboratory reports are included in Appendix A.2.

Vinyl floor tile samples for which no asbestos was found using PLM methods and wipe samples of dust accumulated within heating ductwork were analyzed qualitatively for the presence of asbestos by Transmission Electron Microscopy (TEM) at WESTON's NVLAP accredited electron microscopy laboratory in Auburn, Alabama. Copies of these laboratory reports are also included in Appendix A.2.

All analyses were performed in accordance with protocols set forth in the Laboratory Accreditation package submitted by WESTON under NVLAP. This document includes standard procedures for sample analysis and quality assurance/quality control (QA/QC) which were acceptable to NIST. The QA/QC protocols for the laboratory differ significantly from those commonly found in chemical analysis procedures, due to the nature of the analytical procedure. Since there are no reagents, digestions, or other steps in the process that

provide significant opportunities for sample contamination or analyte loss, lot blanks and sample spikes are not performed. Instead, all analyses are performed using the following steps:

- Incoming samples are divided into lots of ten for analysis.
- One sample is selected at random to serve as the QC check and divided into two containers.
- The sample lot is assigned to an analyst who determines the asbestos content of each sample.
- The QC sample is analyzed by a different analyst, designated by the sample custodian.
- The results of both analysts are submitted to the QC Coordinator for review, and comparison to the laboratory QC chart.
- The results are reviewed and approved, based on the written QC review procedures, or rejected. If rejected, the sample lot and QC sample are reanalyzed.

The WESTON laboratory routinely runs blank checks to ensure that equipment and refractive index oils are not contaminated, collects and analyzes samples of the air in the work areas to document that airborne asbestos fibers do not threaten worker health or contaminate samples, and analyzes samples submitted by NIST to document precision of results as required by the NVLAP program. Samples provided in past rounds of proficiency checks are used for analyst training and to document analyst proficiency. The use of third party laboratory comparisons is often done, and is accomplished by sending duplicates of samples to an outside laboratory and comparing the results obtained by the two facilities.

In interpreting the asbestos results, it should be noted that the definition of asbestos presence differs between the EPA and some state agencies. According to the EPA definition, any materials that contain greater than one per cent (>1%) asbestos are classified as ACM by the 1977 NESHAP regulations. However, California has recently implemented state regulations that consider all materials containing 0.1 per cent or more asbestos as asbestos-containing. It is believed that several other states will soon follow the lead of California in lowering the threshold limit to 0.1 per cent, including some in which properties under review in this study are located. Currently, the State of New Jersey continues to abide by the EPA definition, hence, all samples containing >1% asbestos are considered to be ACM.

The matter is further complicated by the fact that the PLM method was developed specifically for friable materials, but not for non-friable types of suspect ACM such as vinyl floor tiles, vinyl sheeting, and siding. In fact, no specific method has been developed and promulgated to date for such samples, so laboratories use PLM as the only available documented procedure for their analysis. PLM has an inherent limitation on fiber resolution of about 0.25 micrometer (μm) in diameter, while reliable detection and quantification of fibers smaller than 1 μm in diameter is difficult. The manufacturing process for vinyl floor tiles, for example, often produces the very small fiber diameters which cannot be seen by PLM. WESTON's experience is that frequently such samples do, in fact, contain significant quantities of asbestos. WESTON has developed a qualitative technique using TEM to detect the presence of such small fibers and minimize false negatives in the laboratory results. This technique, however, does not allow a good quantitative estimate of asbestos content.

For these reasons, the WESTON laboratories have implemented a policy of reporting asbestos presence as follows:

- Asbestos determined by PLM to be present at greater than 1% is reported as the quantity detected.
- If asbestos is estimated to be less than 1% by PLM, it is reported as <1%. This estimate of asbestos content may be made when only one asbestos structure is observed.
- If asbestos is not detected in certain non-friable materials by PLM, then the samples are subjected to TEM analysis. The results are reported as positive if asbestos is detected by TEM.

Recommendations made in this report are based on the >1% regulatory limit, except for floor tiles as discussed earlier and except as otherwise noted. However, all samples in which asbestos is observed are discussed. This represents a conservative approach to the assessment of asbestos presence at the facility.

Table 2.1 contains a summary of all samples collected at the Holmdel FHU, including sample locations, material descriptions, and laboratory results. PLM results are quantitative while TEM results are qualitative. Quantity estimates for materials sampled that were suspected to contain asbestos are presented in Table 2.2. The field notes describing the observations are provided in Appendix A.1, while copies of the original laboratory reports are included as Appendix A.2.

Two of the floor covering samples were found by PLM to contain asbestos at 3% or greater. One other sample was found by PLM to contain asbestos at a concentration of <1%. Three samples were found to contain no detectable asbestos by both PLM and TEM analysis. Thus three of the six samples were found to contain asbestos. The nine units not inspected should be considered to have ACM present in the floor coverings unless additional sampling and analysis is performed and shows that no asbestos is present in these units.

Analytical results for the dust samples taken from the heater ductwork indicate that this dust contains asbestos fibers. Qualitative TEM analysis revealed the presence of asbestos in nine of the twelve dust samples. At least two samples from each unit had detectable asbestos fibers. This data lead to the conclusion that asbestos is found in the dust found in the heating ducts.

2.4 CONCLUSIONS AND RECOMMENDATIONS

The sample analyses performed by WESTON have revealed that asbestos is present in dust accumulated within the heating ductwork and in the floor tile and vinyl sheeting in the three units examined. These units are thought to be representative of the other nine at the site, but this was not confirmed by sampling all the units.

TABLE 2.1
BULK SAMPLE SUMMARY
HOLMDEL FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	ASBESTOS CONTENT PLM ANALYSIS	CONFIRMATION TEM ANALYSIS
<hr/>				
Unit 211				

BY213-41-NJ-211-ATD	Dust within ductwork	Bathroom	---	Negative
BY214-41-NJ-211-ATD	Dust within ductwork	Bedroom	---	Positive
BY215-41-NJ-211-ATD	Dust within ductwork	Dining room	---	Positive
BY216-41-NJ-211-ATD	Dust within ductwork	Living room	---	Positive
BY217-41-NJ-211-AFT	Lt brown 12" x 12" floor tile	Hall/Bedrooms/Living room/Dining room	None Detected	Negative
BY218-41-NJ-211-AFT	White vinyl sheeting	Kitchen	None Detected	Negative
<hr/>				
Unit 203				

BY219-41-NJ-203-ATD	Dust within ductwork	Bathroom	---	Positive
BY220-41-NJ-203-ATD	Dust within ductwork	Bedroom	---	Positive
BY221-41-NJ-203-ATD	Dust within ductwork	Dining room	---	Positive
BY222-41-NJ-203-ATD	Dust within ductwork	Living room	---	Negative
BY223-41-NJ-203-AFT	White 12" x 12" floor tile	Hall/Bedrooms/Living room/Dining room	Chrysotile, 3%	
BY224-41-NJ-203-AFT	White vinyl sheeting	Kitchen	Chrysotile, 25%	
<hr/>				
Unit 206				

BY225-41-NJ-206-ATD	Dust within ductwork	Bathroom	---	Positive
BY226-41-NJ-206-ATD	Dust within ductwork	Bedroom	---	Negative
BY227-41-NJ-206-ATD	Dust within ductwork	Dining room	---	Positive
BY228-41-NJ-206-ATD	Dust within ductwork	Living room	---	Positive
BY229-41-NJ-206-AFT	White 12" x 12" floor tile	Hall/Bedrooms/Living room/Dining room	Chrysotile, <1%	
BY230-41-NJ-206-AFT	White vinyl sheeting	Kitchen	None Detected	Negative

TABLE 2.2
ASBESTOS CONTAINING MATERIALS
HOLMDEL FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	QUANTITY	UNITS
<hr/>				
Unit 211				
BY214-41-NJ-211-ATD	Dust within ductwork	Bedroom		N/A
BY215-41-NJ-211-ATD	Dust within ductwork	Dining room		N/A
BY216-41-NJ-211-ATD	Dust within ductwork	Living room		N/A
<hr/>				
Unit 203				
BY219-41-NJ-203-ATD	Dust within ductwork	Bathroom		N/A
BY220-41-NJ-203-ATD	Dust within ductwork	Bedroom		N/A
BY221-41-NJ-203-ATD	Dust within ductwork	Dining room		N/A
BY223-41-NJ-203-AFT	White 12" x 12" floor tile	Hall/Bedrooms/Living room/Dining room	740	Square ft
BY224-41-NJ-203-AFT	White vinyl sheeting	Kitchen	110	Square ft
<hr/>				
Unit 206				
BY225-41-NJ-206-ATD	Dust within ductwork	Bathroom		N/A
BY227-41-NJ-206-ATD	Dust within ductwork	Dining room		N/A
BY228-41-NJ-206-ATD	Dust within ductwork	Living room		N/A
BY229-41-NJ-206-AFT	White 12" x 12" floor tile	Hall/Bedrooms/Living room/Dining room	740	Square ft

The asbestos dust accumulated within the heating ductwork represents an unusual problem, since the source of this asbestos is not readily apparent, and the quantity is not precisely known. As a conservative approach, the heating ductwork located within the concrete slab should be cleaned or permanently sealed when the units are renovated. Since the heating systems are currently operational, sealing the floor vents will require replacement with attic ducts and ceiling vents, or provision of an alternate heating source. If the ducts are cleaned, a high-powered vacuum cleaner equipped with a high-efficiency particulate air (HEPA) filter should be employed, since other vacuum cleaners are not capable of trapping all of the small asbestos fibers that may be present.

The source of the asbestos in the ducts cannot be positively determined, due to the sampling and analysis procedures employed. However, there are several potential sources, based on observations at the numerous facilities inspected during this project. Units, presumed to be the original heaters, found at this and other facilities frequently contained an expansion joint which served to isolate the return air plenum from the heater itself, preventing the transmission of vibrations and noise to the ductwork. The fabric-like material used to form this joint was determined, in some cases, to be chrysotile asbestos in a nearly pure form. It is possible, even likely, that the heating systems in these units had similar expansion joints which have been removed. During the 25 to 30 years that the original units were in service, erosion of these joints was likely, and could have caused asbestos fibers to accumulate in the dust.

Another possibility is that residual debris from the removal of vinyl-asbestos floor tiles, such as was found in other sites, may have been left in the ducts during floor tile removal and replacement. Conversations with the TEM analysts indicate that there was some evidence of chlorine observed during the identification of the asbestos fibers by X-ray dispersion analysis in samples from some sites. The most likely source of this element, considering the site history, is the vinyl chloride polymer which forms the floor tile matrix. However, other asbestos sources, such as debris imported into the facilities from outside activities of the occupants, cannot be ruled out.

Sampling and analysis for airborne asbestos was not performed at this site during the original study due to the lack of an available vacant housing unit during the time of that effort. However, it is recommended by the U.S. Army Environmental Hygiene Agency (AEHA) that, if the units are to remain under the management, operational control, or ownership of the Army, sampling and analysis for airborne asbestos be undertaken. These studies should be performed to provide data from at least ten percent or a minimum of three of the housing units, whichever is greater. This additional sampling and analysis effort, along with the other recommended actions, will help to ensure that there is no long-term exposure risk to the occupants or to maintenance personnel.

The vinyl floor coverings in the three housing units inspected were in good condition, but, should they become broken or damaged, asbestos fibers may be released. The recent EPA clarification of the definition for damaged non-friable materials apparently removes some concerns about the status of these materials at the time of renovation or demolition. Inspection of these normally non-friable materials prior to demolition is required, but, if they are in good condition at the time, they may be left in place as long as planned demolition procedures will not release a significant amount of asbestos fibers. However, if demolition will subject these non-friable materials to grinding, sanding, or abrading, or if demolition involves burning of the structure or debris from the structure, all forms of ACM, including these floor coverings, must be removed in advance.

The vinyl floor coverings should be left in place and managed under an Operations and Maintenance (O&M) program. An O&M program must address the following:

- The locations of all known and suspected ACM.
- The procedures and frequency for periodically assessing the ACM in the facility.
- The procedures for safely handling the ACM during maintenance or removal activities.
- Designation of an asbestos coordinator for the facility.
- The responsibilities and requirements for training of personnel involved with maintenance and renovation of the facility.
- The record-keeping program for the facility.

The vinyl floor materials should be removed during a planned renovation of the units, in accordance with the regulations applicable at the time.

Other suspect materials noted were cloth expansion joints on the heating units, roofing shingles, and roofing felt, which should be managed under an O&M program. Care should be taken during renovations or demolition to identify suspect materials that may have been hidden from the view of the assessment team. The suspect materials observed by the field team, and any hidden suspect materials found later, should be analyzed for the presence of asbestos prior to being disturbed.

SECTION 3. NIKE WASTE

SECTION 3. NIKE WASTE

WESTON personnel conducted an inspection of the Holmdel, New Jersey Family Housing Unit and Nike site on 02 March 1990 in an attempt to locate any buried utility trenches connecting the two areas. The buried utility trenches were documented in the ANL SAP as areas that may possibly have been contaminated by Nike related wastes, including chlorinated solvents and metals.

The primary objective of the SAP was to provide information that would supplement the enhanced PA of the site conducted by ANL for USATHAMA. A selective analytical protocol was planned to determine if certain contaminants were present and, in selected cases, define the general nature of contamination at specific areas of concern. The SAP was not designed or intended to characterize the movement, concentration or extent of contamination at the site.

3.1 SAMPLING RATIONALE

Prior to the site visit, the WESTON field geologist contacted the local DEH representative, Mr. Mike Prino, to obtain information regarding the location of reported abandoned buried utility trenches. An attempt was made by Mr. Prino, to obtain information related to the utility trenches in a phone interview with a retired site maintenance manager. In addition, Mr. Prino conducted a search for old utilities maps. According to Mr. Prino, no old maps of the site could be located and the retired manager had no knowledge of any common utility trenches. Therefore the only way that WESTON could obtain information concerning the buried utility trenches had to be through a site reconnaissance. This examination of the surface also produced no evidence to indicate where, or if, the utility trenches had been constructed. Therefore, no samples were collected for these parameters.

3.2 OBSERVATIONS AND FINDINGS

An inspection of the housing area revealed that the Nike site was located across a surface drainage divide from the housing area. The relief across the divide was slight and may not be sufficient to influence the flow direction of buried utilities or the groundwater to prevent transport of possible contaminants across the divide. Two water tanks and several communication systems, including satellite dishes, microwave relay and radio towers are currently situated in the former location of the decommissioned Nike facility. Extensive alterations had been made to the Nike area since its closure making identification of old structures and utilities impossible.

An inspection of the adjacent housing area revealed evidence of several buried utilities. The surface structures observed included a four-inch diameter goose-neck vent pipe near the fenced boundary line behind Unit 201, water supply valves at the street corner in front of Unit 201, and a sewage manhole behind Unit 201. Although these surface structures were located, no other evidence concerning the location or direction of the reported underground trench could be determined visually. Since no buried utility trench locations were positively identified, soil sampling was not performed.

3.3 CONCLUSIONS AND RECOMMENDATIONS

No evidence was found indicating the existence or former location of a common buried utility trench at the Holmdel FHU property. The actions taken met the requirements of the SAP, and no further studies are planned at this time. There is little likelihood of locating aids such as as-built drawings, which were not available in the facility files.

SECTION 4. TRANSFORMER OILS

SECTION 4. TRANSFORMER OILS

Mr. Kevin Fulmer and Mr. Rick Evans of WESTON contacted a DEH representative for the Holmdel facility on 26 February 1990 to schedule the evaluation of the potential use of polychlorinated biphenyls (PCBs) in mixtures used as insulating oils in the existing transformers serving the facility. All transformers at the Holmdel property were determined to be owned by the local utility company, Jersey Central Power and Light Company (JCP&L). JCP&L refused to provide information on the PCB status of these transformers, and refused to allow sampling by WESTON or the Army. A letter from Mr. Michael Prino of the DEH office, stating these facts, was provided and is included in Appendix C with the field notes.

4.1 CONCLUSIONS AND RECOMMENDATIONS

These transformers do not belong to the U.S. Army and are the responsibility of the owner, JCP&L. They are in use and do not appear to be leaking, so they appear to be of no concern during the realignment of this facility.

SECTION 5. SUMMARY OF FINDINGS

SECTION 5. SUMMARY OF FINDINGS

Sampling and analyses performed at the Holmdel, New Jersey FHU reveal the presence of several issues of concern from an environmental standpoint. The detection of asbestos in nine of the 12 dust samples and three of six samples of floor tile and vinyl sheeting, presents some issues of environmental concern. No pipe insulation of any type was observed that was suspected of containing asbestos.

The following practices should be observed with regard to the known and suspected asbestos-containing materials identified:

- The risks posed by the asbestos-containing dust in the ductwork cannot be clearly evaluated, since the program only called for a qualitative screening of this material. Airborne asbestos was not sampled at this site to determine the impact, if any, of asbestos fibers that were detected in the dust deposited in the ductwork of the heating system. During the follow-up study by a WESTON Certified Industrial Hygienist there was no available vacant housing unit in which to collect the necessary samples. Air sampling has been recommended by AEHA to define what risks, if any, are presented by these findings.
- The vinyl floor coverings pose no significant risk as long as they are in good condition and are not damaged by excessive wear or misuse. They should be left in place and managed under an O&M program which describes procedures for the regular inspection of the floor coverings and the removal and replacement of any that become damaged.
- Other suspect materials identified at the site, including cloth expansion joints and roofing materials, should be assumed to contain asbestos and managed in place under an O&M program until they are either removed or determined to contain no asbestos.

Sampling of the utility trenches was not performed as specified by the SAP. The local DEH representative, who had been assigned to his position for only a few weeks at the time of the field assessment, was unable to locate the utility trench that may have been present at one time. There was no surficial or topographical evidence to aid in this assignment. Since the field crew and DEH support personnel were unable to identify the trench location, this sampling activity could not be completed.

Investigation of the electrical supply system at the property revealed that all transformers located on the property are owned by JCP&L. Transformer ownership was verified in a letter supplied by the Department Of The Army, Directorate of Engineering and Housing, Fort Dix, New Jersey. WESTON concludes ownership and responsibility for the transformers does not lie with the U.S. Army.

APPENDIX A.1. FIELD DATA

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01
 FACILITY/BLDG. NO. Holmdel FHU #211
 FACILITY CONTACT Mike Prino TELEPHONE NUMBER 659-562-5198
 TECHNICIAN NAME L. Jaye SIGNATURE Nolan L. Jaye
 TECHNICIAN NAME A. Busby SIGNATURE Arthur M. Busby
 TIME ARRIVED 1000 TIME DEPARTED 1030 DATE 21 / FEB / 90
dd mm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

Unit # 211 is a 3-bedroom house with a pitched, shingle roof and vinyl siding. Heat is forced air oil fire. No pipe insulation was seen - piping went down into foundation. Dust samples and floor tile were taken. A suspect ACM expansion joint on the Heater in Boiler Room was noted, but not sampled. Unit was occupied at the time of our inspection.

The duct work inside of the cement slab appeared to be some sort of cementitious pipe (Trusite?). The pipe is approx. 6 to 8" in diameter and leads from the forced air heating system to all rooms in the house. All of the houses are identical in their floor plan and all appear to be identical in their composition of building materials.

ACTIVITY CHECKLIST

Interviews Completed	✓	Number of Samples	6
Drawings Reviewed	N/A	Survey Form Completed	/
Drawings Attached	/	Site Log Completed	/
Visual Inspection	/	Chain-of-Custody Initiated	/
Number of Photos	0	Exp. Assess. Form Init.	/
Q.A. Check	SIGNATURE	DATE	1 / 1990
		dd	mm yy

SITE SURVEY LOG

(Continued)

Mr. Prino set up the houses that we were to inspect. because He chose these buildings because the occupants were home and he could set up atime easy.

We did not see any homes with more than one layer of floor tile in them.

ASBESTOS SURVEY DATA

0507

BLDG. NO.: 21111
INSTALLATION 01411

TASK TEAM MEMBERS

L. Jaye

A. Busby

W.O. No. 2104-13-01

CLIENT: ARGONNE NATIONAL LAB

BLDG. NAME: Hoboken NJ FTHU

DATE (dd/mm/yy): 21/FEB/90

BLDG. DESCRIPTION: 3-br, pitched roof, vinyl siding

TIME ARRIVED: 1000

NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Dust samples in floor vent
02	Lt brown 12x12 Floor tile 3 b/s, DR, LR (square feet)
03	white vinyl flouring (square feet)

TECHNICIAN
SIGNATURE

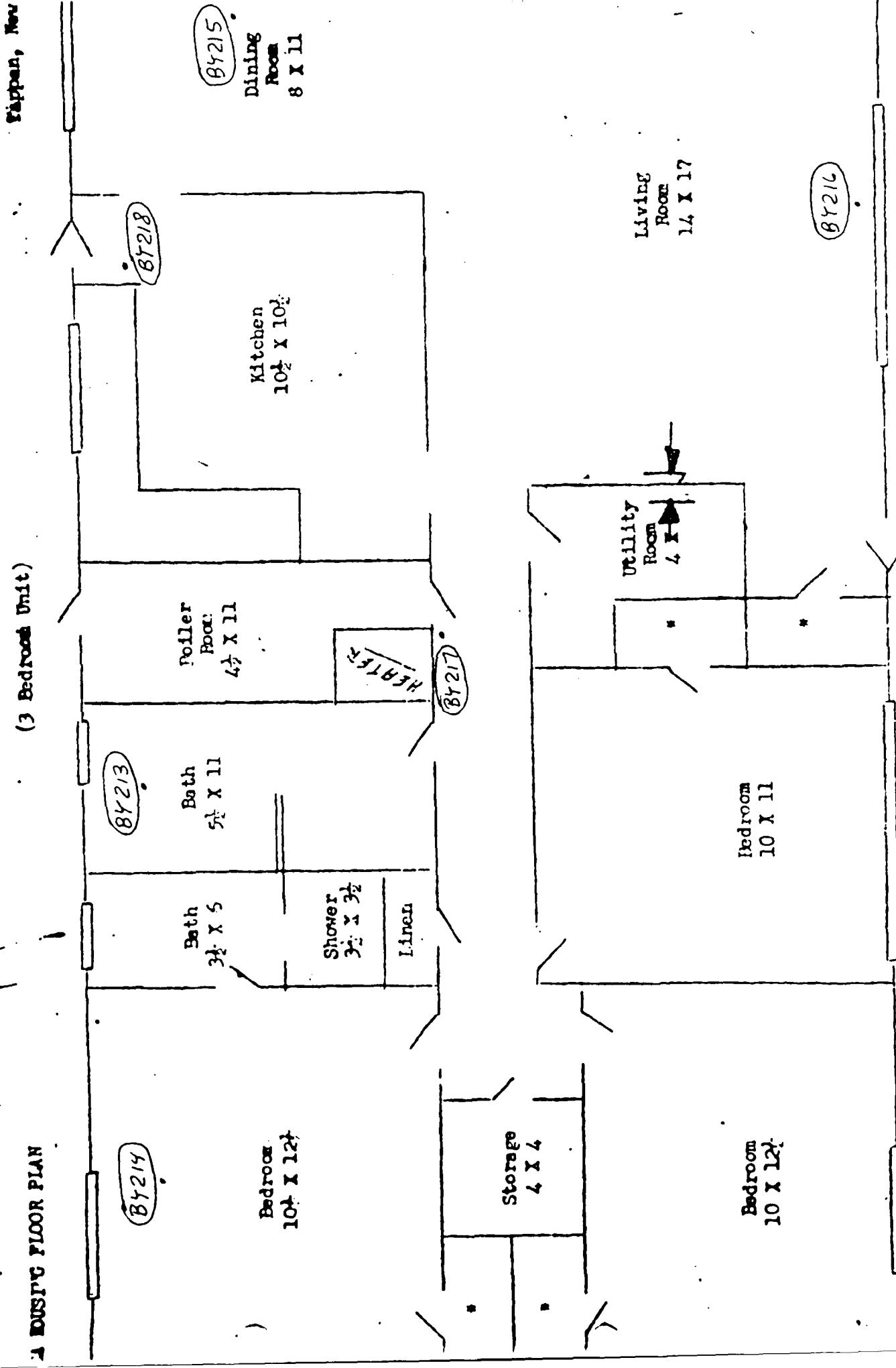
Robert Jayne

**QUALITY ASSURANCE
SIGNATURE**

HOLMDEL FH4 # 211

A DURST FLOOR PLAN

(3 Bedroom Unit)



0509

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01
 FACILITY/BLDG. NO. Holmdel FHU # 203
 FACILITY CONTACT Mike Prino TELEPHONE NUMBER 659-562-5198
 TECHNICIAN NAME L. Jaye SIGNATURE Nolan L. Jaye
 TECHNICIAN NAME A. Busby SIGNATURE Albert M. Busby
 TIME ARRIVED 1030 TIME DEPARTED 1100 DATE 21 / FEB / 90
dd mmmm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

Unit # 203 is a 3-bedroom house with a pitched, shingle roof and vinyl siding. Heat is forced air oil fire. No pipe insulation was noted. A suspect ACM expansion joint was noted on Heating unit. Dust samples and floor tile was sampled. House was occupied when we made our inspection.

ACTIVITY CHECKLIST

Interviews Completed	<input checked="" type="checkbox"/>	Number of Samples	<input checked="" type="checkbox"/> 6
Drawings Reviewed	<input checked="" type="checkbox"/> N/A	Survey Form Completed	<input checked="" type="checkbox"/>
Drawings Attached	<input checked="" type="checkbox"/>	Site Log Completed	<input checked="" type="checkbox"/>
Visual Inspection	<input checked="" type="checkbox"/>	Chain-of-Custody Initiated	<input checked="" type="checkbox"/>
Number of Photos	<input checked="" type="checkbox"/> 0	Exp. Assess. Form Init.	<input checked="" type="checkbox"/>
Q.A. Check	<input checked="" type="checkbox"/>	DATE	<u>21 / FEB / 90</u> <u>dd mmmm yy</u>
SIGNATURE			

ASBESTOS SURVEY DATA

0511

BLDG. NO.: 21013
INSTALLATION 01411

TASK TEAM MEMBERS

L. Jaye

A. Busby

BIRD NAME: Holmdel NJ FHY

BLDG. NAME: _____

W.O. No. 2104-13-01

CLIENT: ARGONNE NATIONAL LAB

DATE (dd/mm/yy): 24/Feb/90

TIME ARRIVED: 1030

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	B11219-411-NJ-203-A1TD					BATH ROOM	1		10814A	01
2.	B11220-411-MJ-203-A1TD					BED ROOM	1		10814A	01
3.	B11221-411-MJ-203-A1TD					DINING ROOM	1		10814A	01
4.	B11222-411-MJ-203-A1TD					LIVING ROOM	1		10814A	01
5.	B11223-411-MJ-203-A1FT					HALL	749		10814B	02
6.	B11224-411-NJ-203-A1FT					KITCHEN	110		10814C	03
7.	111-1-1-1-1-A11						1			1
8.	111-1-1-1-1-A11						1			1
9.	111-1-1-1-1-A11						1			1
10.	111-1-1-1-1-A11						1			1
11.	111-1-1-1-1-A11						1			1
12.	111-1-1-1-1-A11						1			1

NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Dust samples in floor vents.
02	white 12x12 flour tile 3 bxs, DR, LR (Square feet)
03	white vinyl flooring (square feet)

**TECHNICIAN
SIGNATURE**

Robert J. Jeff

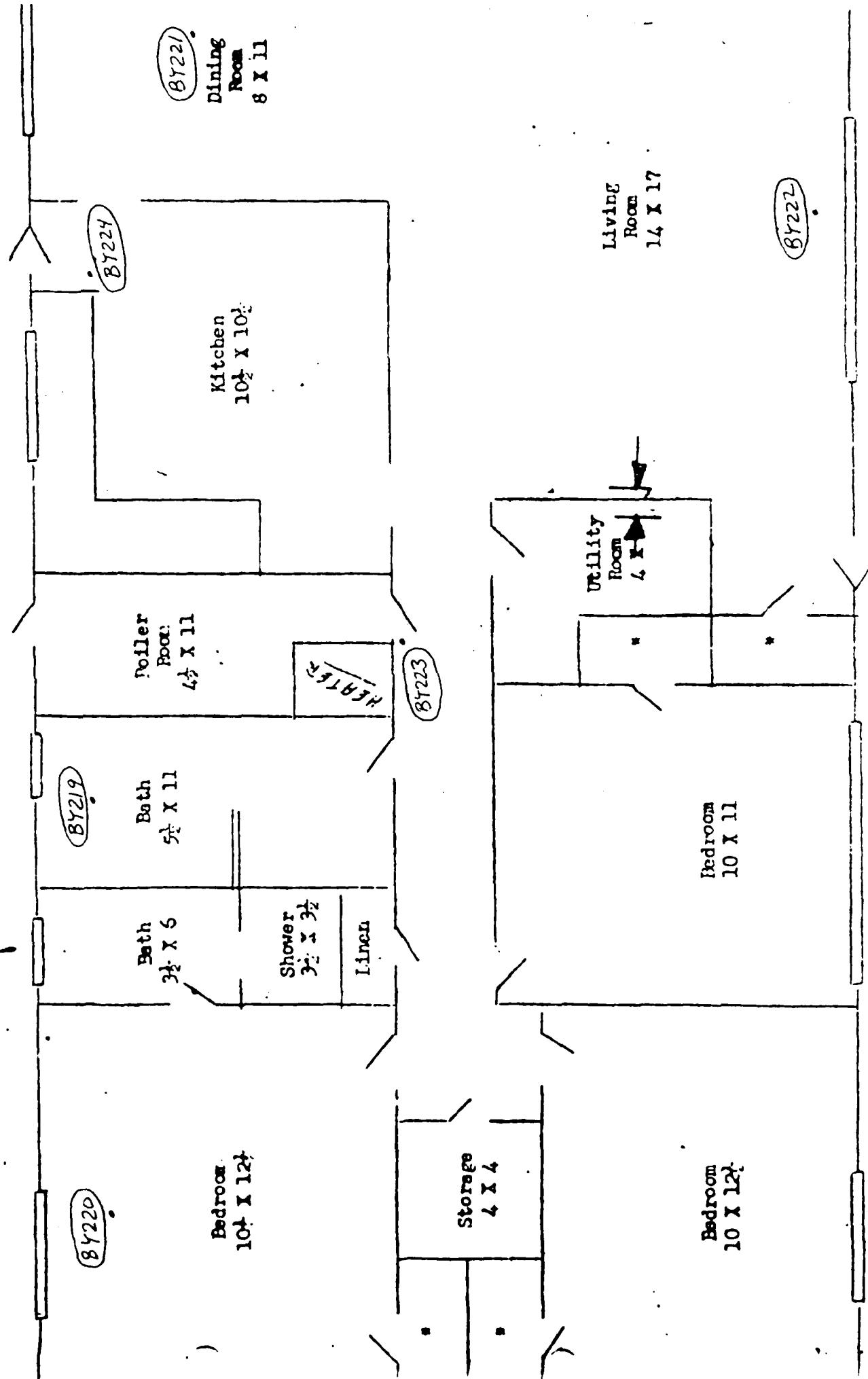
**QUALITY ASSURANCE
SIGNATURE**

HOLMDEL FH # 203

A DORMER FLOOR PLAN

Guppen, Rev

(3 Bedrock Unit)



SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01
 FACILITY/BLDG. NO. Holmdel FH4 # 206
 FACILITY CONTACT Mike Prino TELEPHONE NUMBER 659-562-5198
 TECHNICIAN NAME L. Jaye SIGNATURE Nala L Jaye
 TECHNICIAN NAME A. Busby SIGNATURE Arthur M. Busby
 TIME ARRIVED 1100 TIME DEPARTED 1130 DATE 21 / FEB / 90
dd mm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

Unit 206 is a 3-bedroom house with a pitched, shingle roof and vinyl siding. Heat is forced air oil fire. No pipe insulation noted. Suspect ACM expansion joint on heating unit. Dust in four vents and four tile were sampled. Unit was occupied at the time of our inspection.

ACTIVITY CHECKLIST

Interviews Completed	<input checked="" type="checkbox"/>	Number of Samples	<u>6</u>
Drawings Reviewed	<u>N/A</u>	Survey Form Completed	<input checked="" type="checkbox"/>
Drawings Attached	<input checked="" type="checkbox"/>	Site Log Completed	<input checked="" type="checkbox"/>
Visual Inspection	<input checked="" type="checkbox"/>	Chain-of-Custody Initiated	<input checked="" type="checkbox"/>
Number of Photos	<u>0</u>	Exp. Assess. Form Init.	<input checked="" type="checkbox"/>
Q.A. Check	<u>SIGNATURE</u>	DATE	<u>21 / FEB / 90</u>
		dd mm yy	

ASBESTOS SURVEY DATA

0515

BLDG. NO.: 2016
INSTALLATION 01411

TASK TEAM MEMBERS

L. Jane

A. Bushy

W.O. No. 2104-13-01

CLIENT: ARGONNE NATIONAL LAB

BLDG. NAME: Holmdel NJ F4U

DATE (dd/mm/yy): 21/FEB/90

BLDG. DESCRIPTION: 3-br, pitched roof, vinyl Siding

TIME ARRIVED: 1100

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	B11225-41	NJ	-	206	-	BATHROOM	1		101815A	01
2.	B11226-41	NJ	-	206	-	BEDROOM	1		101815A	01
3.	B11227-41	NJ	-	206	-	DINING ROOM	1		101815A	01
4.	B11228-41	NJ	-	206	-	LIVING ROOM	1		101815A	01
5.	B11229-41	NJ	-	206	-	HALL	1		100513	02
6.	B11230-41	NJ	-	206	-	KITCHEN	1		101815C	03
7.			-	-	-	All	1			1
8.			-	-	-	All	1			1
9.			-	-	-	All	1			1
10.			-	-	-	All	1			1
11.			-	-	-	All	1			1
12.			-	-	-	All	1			1

NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Dust samples in flour vents
02	white 12x12 floor tile 3 bxs, DR, L.E (Square feet)
03	white linoleum vinyl flooring (Square feet)

**TECHNICIAN
SIGNATURE**

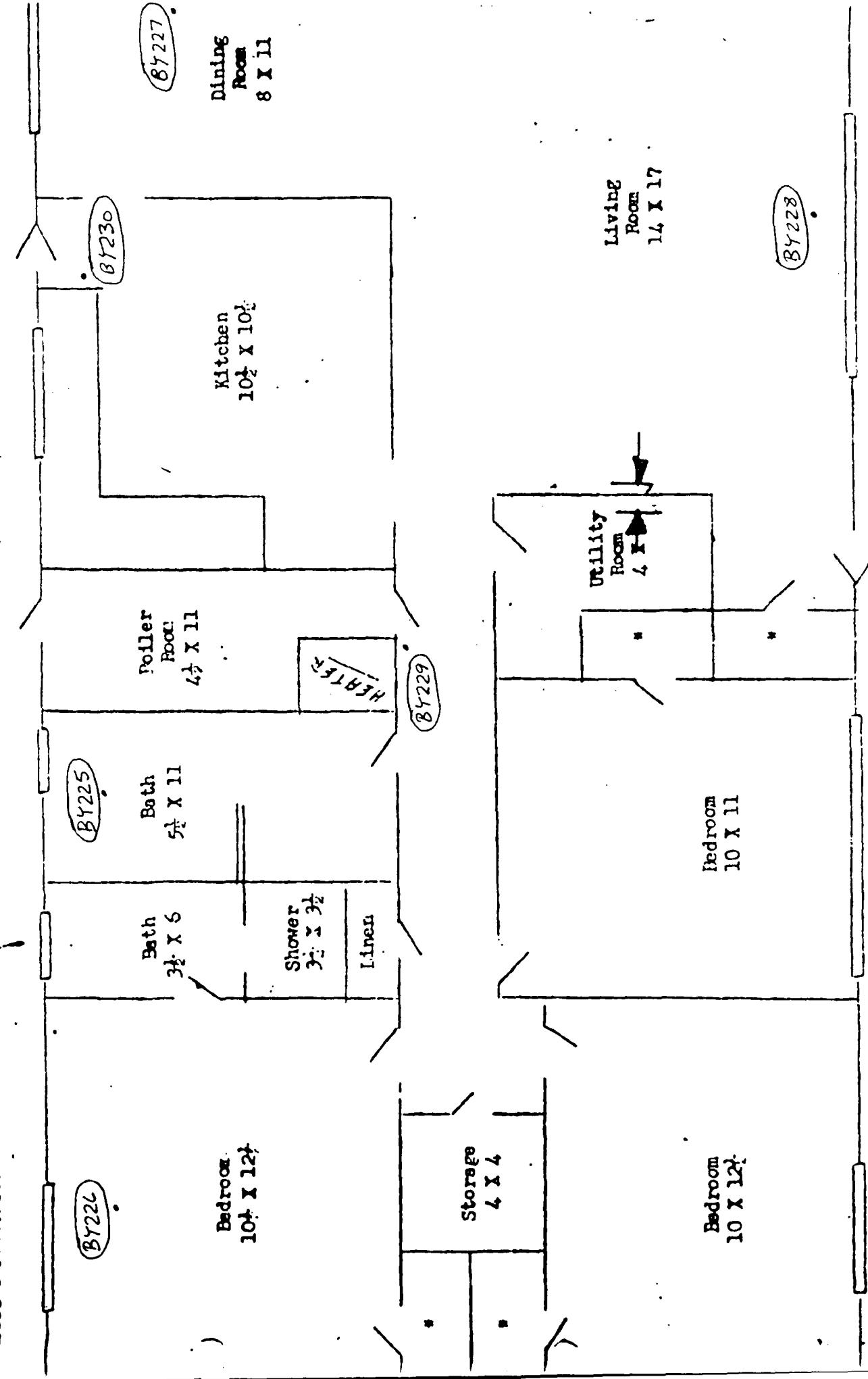
Mark Jay Jr

**QUALITY ASSURANCE
SIGNATURE**

A BUDGET FLOOR PLAN

(3 Bedrock Unit)

Fappan, New



APPENDIX A.2. LABORATORY DATA

BULK SAMPLE ANALYSIS SUMMARY

Weston W.C. No. 2104-13-01-0000

Sample Number BY217 through Sample BY230

AO LAB ID NO	CLIENT/CLIENT ID	LOCATION	MATERIAL DESCRIPTION *	DATE RECEIVED	** RESULTS						
					CH	AM	CR	OT	TL	LAYERS	ANALYST
BY217	41-NJ-211-AFT	HALL	NF, BR, 12X12 FT	02/23/90	ND	ND	ND	ND	ND	No	07323
BY218	41-NJ-211-AFT	KITCHN	NF, WH, VINYL FLR	02/23/90	ND	ND	ND	ND	ND	No	07323
BY223	41-NJ-203-AFT	HALL	NF, WH, 12X12 FT	02/23/90	3	ND	ND	ND	3	Yes	07323
BY224	41-NJ-203-AFT	KITCHN	NF, WH, VINYL FLR	02/23/90	25	ND	ND	ND	25	No	07323
BY229	41-NJ-206-AFT	HALL	NF, WH, 12X12 FT	02/23/90	<1	ND	ND	ND	<1	Yes	07323
BY230	41-NJ-206-AFT	KITCHN	NF, WH, LIN VIN FL	02/23/90	ND	ND	ND	ND	ND	Yes	06071

*	MATERIAL DESCRIPTION	FRIABLE ¹	COLOR ²	SYSTEM ³	
	Friable ¹ , Color ² , System ³ , Type	F - Friable NF - Non-Friable	BK - Black BL - Blue BR - Brown GR - Green GY - Gray	RD - Red TN - Tan WH - White YL - Yellow	CHW - Chilled Water DOM - Domestic Water HHW - Heating Hot Water STM - Steam UNK - Unknown
** RESULTS	CH - Chrysotile AM - Amosite CR - Crocidolite	OT - Other TL - Total			

Upon issue, this report may be reproduced only in full.

All analyses are performed in accordance with the methods set forth in U.S. EPA 600/M4-82-020, as amended. Weston's Optical Microscopy Laboratory is accredited by the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program for asbestos fiber analysis (Laboratory Code 1254).



ROY F. WESTON, INC.
1635 PUMPHREY AVE.
AUBURN, AL 36830
PHONE: (205) 826-6100
FAX: (205) 826-8232

Transmission Electron Microscopy Asbestos Summary Report

Client: Argonne National Laboratories Weston W.O. No.: 2104-13-01-0000

Sample Type(s): Dust and Floor Tiles Sampling Location: Holmdel

QUALITATIVE ANALYSIS

FLOOR TILES: A 0.5 to 2.0 gram portion of each floor tile sample was ultrasonically disaggregated in four milliliters of deionized, 0.2 μm membrane filtered water. After the coarse fraction settled, a drop of the suspended, clay-sized fraction was placed on a Formvar coated 200 mesh Cu TEM grid and allowed to dry. The grid was carbon coated for thermal stability in the electron beam and examined with a Philips CM12 transmission electron microscope operating at 120 kilovolts accelerating voltage.

DUST WIPE SAMPLES: A generous loading of dust was collected on a pre-wetted, 25 square centimeter section of a cleanroom wipe. The wipe was placed in a two ounce wide mouth collection vial and returned to the laboratory. Ten to fifteen milliliters of filtered, deionized water was added to suspend the dust. The suspension was ultrasonically dispersed and the coarse fraction was allowed to settle. A drop of the suspension was placed on a Formvar coated 200 mesh Cu TEM grid and allowed to dry. The grid was carbon coated as above and examined by transmission electron microscopy at 120 kilovolts accelerating voltage.

ANALYTICAL RESULTS

<u>SAMPLE IDENTIFICATION</u>	<u>RESULTS</u>
BY213-41-NJ-211-ATD	Negative
BY214-41-NJ-211-ATD	Positive
BY215-41-NJ-211-ATD	Positive
BY216-41-NJ-211-ATD	Positive
BY217-41-NJ-211-AFT	Negative
BY218-41-NJ-211-AFT	Negative



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ANALYTICAL RESULTS
(continued)

SAMPLE IDENTIFICATION

BY219-41-NJ-203-ATD
BY220-41-NJ-203-ATD
BY221-41-NJ-203-ATD
BY222-41-NJ-203-ATD
BY225-41-NJ-206-ATD
BY226-41-NJ-206-ATD
BY227-41-NJ-206-ATD
BY228-41-NJ-206-ATD
BY230-41-NJ-206-AFT

RESULTS

Positive
Positive
Positive
Negative
Positive
Negative
Positive
Positive
Negative

(Approved for Transmittal)

3/21/90

(Date)

- * This test report relates only to the specific items tested.
- ** These sample results may only be reproduced in full, and are valid only if approved for transmittal.

APPENDIX B. NIKE WASTE SUPPORTING DATA

(16)

28 FEB 90

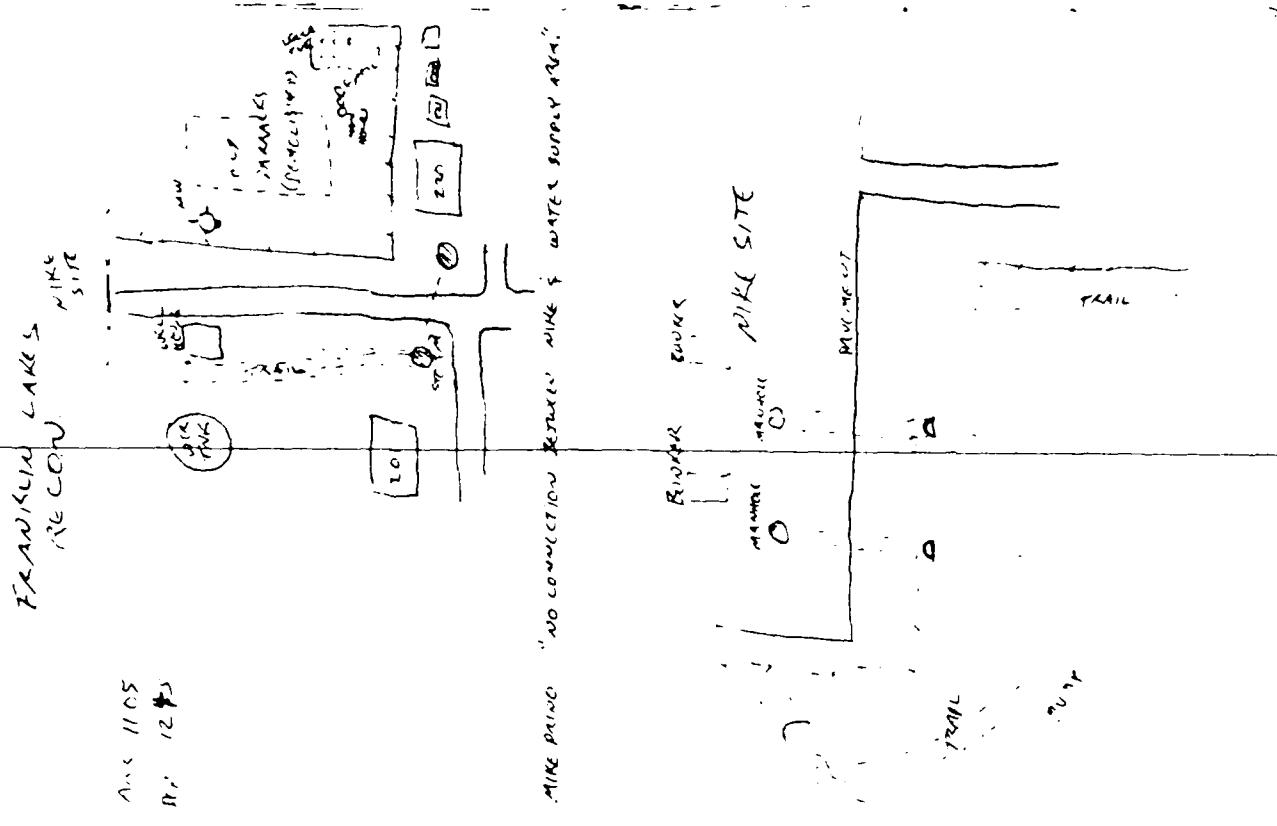
M. ESTERSON (11)

MOLEHOLE
Plant line - wind 9009719
9009722 3/10

CLEMENTS

AFN NO. 9009704

DC 11 CLEVER
S/T ABUNDANCE, ALL
CUT OFF



APPENDIX C. TRANSFORMERS EVALUATIONS

3/16 with

for Monday
plan, utility
ice!

10
11
12

8PM

750

2CA

trace - info

• FAFU units,

Mr. Wayne
is formed
old

- All transformers were found to be PCB contaminated.
- We went back to Fort Hamilton to verify records - No records were available
- Cost estimate for replacement(s) was \$70,000 (6K for disposal each alone!)
- Mike Prino
- NOT THERE

Alex Muscie

- Informed him of today's events

Mike Prino

- JCP&L told Mike that the following sites are not to be sampled:
 - OLW Bridge
 - HOLMOE
 - LIVINGSTON
- This was per JCP&L's Bob Esposito (Chief Electrical Engineer)
- The reason is that JCP&L owns the poles & transformers
- Franklin Lakes scheduled for Thursday 10 am
- Alex Muscie
- Informed him of the above.

Armen MAGDA

- Scheduled Sheldon (tentatively) for Friday, this week, at 10:30 AM

Freeman

- Scheduled Spring Valley for



DEPARTMENT OF THE ARMY
HEADQUARTERS, US ARMY TRAINING CENTER AND FORT DIX
FORT DIX, NEW JERSEY
08640-5522

REPLY TO
ATTENTION OF

May 3, 1990

Directorate of Engineering
and Housing

Kevin Fuller
Roy F. Weston Research Consultants
1 Weston Way
West Chester, PA 19380

Dear Mr. Fuller:

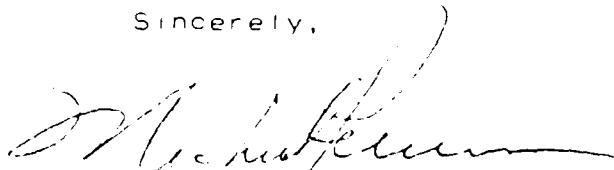
Weston Research Consultants were contracted to conduct an environmental survey of Stand-Alone Housing as part of the Base Realignment Closure Act.

Jersey Central Power (JCP) which supplies power to Livingston, Old Bridge and Holmdel Stand-Alone Housing areas, and owns the transformers and utility poles, refused our request to perform PCP testing as part of the environmental survey being performed by Weston Research.

Mr. Bob Esposto, Jersey Central Power Representative, felt that our request for PCP testing was unnecessary since JCP periodically performed their own testing.

As a result of JCP denial, testing for PCP could not be accomplished for the aforementioned Stand-Alone Housing areas by Weston Research Consultants.

Sincerely,


Michael Primo
DEH, Housing Engineer Technician